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REMARKS

- 5 Before discussing the final Office Action, Applicant refers to the amended claims and identifies support for the amendments in the claims from the originally filed application. To this end, Applicant refers to the translation of PCT application PCT/EP00/02144 as originally filed.
- 10 Throughout the text, Applicant has replaced the term "text component" by the term "linguistic text component." This amendment is supported by page 14, third paragraph, lines 14 and 15.  
Furthermore, Applicant has introduced a limitation regarding the partial information allocated to the simultaneously possible formulation alternatives so that possible formulation alternatives for a sentence fulfill a specific condition which is such that arbitrary information can be hidden in the text. This amendment is supported by page 23, fourth paragraph, lines 1-5 and page 24, last paragraph, line 12. Regarding the probability distribution feature, please refer to page 36, third paragraph, lines 5-11.
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Furthermore, Applicant has included limitations regarding the means for linguistically analyzing. Particularly, the means for linguistically analyzing includes a parser as outlined on page 14, line 15. Furthermore, the parser recursively breaks down the text sentence and recursively processes the remainder as outlined on page 14, line 19. This is also stated on page 35, line 6 or page 35, second paragraph. The hierarchy tree feature is on page 40, line 22 or page 19, line 4 or page 35, second paragraph.

Furthermore, the parser includes a dictionary grammar stage having an entry for a predicate or head as outlined in page 15, third paragraph. Furthermore, the

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entry for the linguistic head or predicate is not only used and produced by the parser, but is then used by the means for determining a plurality of formulation alternatives so that parsing alternatives resulting in grammatically incorrect formulation alternatives are excluded early. To this end, please refer to page 15,  
5 line 4 and 5 and page 16, line 4.

Furthermore, the means for determining is also operative to leave a sentence unchanged when valid formulation alternatives cannot be found as outlined on page 21, line 31 and on page 36, line 6.

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2. In accordance with amended Claim 1, the means for linguistically analyzing the text includes a parser, which is a recursive parser, which recursively breaks down the sentence into the text component using a hierarchical tree-structure.

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Furthermore, the parser determines the predicate and remaining elements of the sentence and then again recursively searches a linguistic head within the remaining elements of the sentence and so on until the text components of the sentence are obtained. Thus, as outlined in the penultimate paragraph of Claim 1, the parser uses an entry for the predicate or the linguistic head to early exclude parsing alternatives resulting in grammatically incorrect formulation alternatives.

Thus, the operation of the recursive parser is as follows:

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In a first recursion step, the parser looks for the predicate and also determines the remaining elements of the sentence. However, the inventive parser now excludes incorrect formulation alternatives using the entry for the predicate. Then, in a next recursion step, the remaining elements of the sentence are examined by the parser to search for the linguistic head among these remaining elements. When the linguistic head is found, the parser in accordance with the

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invention is again operative to exclude formulation alternatives based on the entry for the linguistic head.

This hierarchical tree-structured recursive procedure makes sure that a very  
5 efficient parsing procedure is conducted because one does not have to construct  
each and every formulation alternative for the whole sentence and then  
determine which formulation alternatives are correct and which are not correct.  
Instead, this can be done from top to bottom in the tree-structure controlled by  
the entry for the predicate in the first recursion step and the linguistic head in  
10 second and further recursion steps.

Additionally, and this is also a key feature of the invention in accordance with  
amended Claim 1, a set of simultaneously possible formulation alternatives for  
the sentence is determined which has an overall probability of 1.0. This allows  
15 hiding of arbitrary information within the text because a formulation alternative  
exists for each sequence of bits of an information to be hidden in the text.

Furthermore, the probability distribution for the simultaneously possible  
formulation alternatives controls the allocation of partial information to the  
20 simultaneously possible formulation alternatives. Because the simultaneously  
possible formulation alternatives are recursively determined using the  
hierarchical tree parsing principle and because as defined in Claim 1, the overall  
probability of 1.0 has to be guaranteed for the simultaneously possible  
formulation alternatives, the means for determining is tightly coupled to the  
25 parser, i.e., the means for analyzing operates such that parsing and allocating of  
partial information always fulfills the conditions regarding the overall probability of  
1.0 and the probability distribution for the simultaneously possible formulation  
alternatives.

30 As stated before, in accordance with Claim 1, the partial information allocated to  
the text components is such that the partial information allocated to all

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simultaneously possible formulation alternatives is such that arbitrary information can be hidden in the text. Thus, the inventive device can process arbitrary input bit sequences and the case cannot happen that a certain input sequence cannot be processed by the inventive information hider. Instead, when the inventive 5 device finds a sentence for which no valid formulation alternatives having specific partial information allocated thereto can be found, the sentence is not changed and no information is hidden into that sentence.

This is also a specific feature of the invention because the usage of incorrect 10 formulation alternatives which would be necessary, e.g. where one tries to hide at least two different bits in every sentence, resulting in processed text that might look suspicious. In accordance with the invention, this can never happen because problematic sentences which do not have formulation alternatives are not processed. This, of course, decreases the bandwidth somewhat, but, 15 importantly, it is not necessary to signal whether a sentence has received information or not. This is due to the fact that, on the receiver/extractor side the same parser is working which, as outlined in claim 20, uses a dictionary/grammar stage and, therefore, also finds out, whether a sentence has valid formulation alternatives or not. When the extractor-side processor receives a sentence for 20 which no valid formulation alternatives can be found, the extractor automatically recognizes that no information is hidden in that sentence so that, as defined in the second paragraph of page 9, no partial information is produced from a sentence not having valid formulation alternatives.

25 Again, the extractor-side means for producing partial information uses the entry for the predicate and the linguistic head to exclude parsing alternatives which result in incorrect formulation alternatives. Thus, the inventive extractor device can also – in the same way as the hiding device – efficiently and quickly process a text while assuring that the partial information allocated to simultaneously 30 possible formulation alternatives is such that arbitrary information can be hidden.

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Amended Claim 20 relating to the extractor is based on the same disclosure as has been discussed in connection with Claim 1. Finally, the method Claims 25 and 26 are also based on the same disclosure as discussed in connection with Claim 1.

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From the comparison of Claim 20 and Claim 1, it becomes clear that the information hider is similar to the information extractor with respect to the means for analyzing.

10 Finally, Applicant notes new Claim 29, which is supported by the second paragraph of page 15, page 23 and page 24, fourth paragraph.

15 The features in this new claim provide the advantage that the reformulated phrase has a similar statistical distribution of linguistic elements to the naturally written text of a comparison group or that person. Personal writing style can be used for statistics.

New Claim 30 is supported by page 5, second paragraph, page 21, first paragraph and page 22, first paragraph.

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New Claim 31 is supported by page 18, fourth paragraph, page 35, second paragraph, page 15, first paragraph, page 18, second paragraph, page 38, second paragraph.

25 Amended Claim 30 defines the usage of the linguistic context as for example discussed in the first paragraph of page 21, which is used to determine which formulation alternative is grammatically or statistically correct or straight-forward. This context information is often stored in the corresponding linguistic heads. Even adjectives and articles which have to be amended due to the fact that their 30 linguistic head has for example changed the gender would be defined in such a context.

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3. Under section 4 of the Office Action, the Examiner objected to the amended claims due to the written description requirement. To overcome this objection, Applicant has reverted to the means plus function style.

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4. 35 USC 103. With regard to section 3 of the Office Action "Response to Arguments," note the following:

Bender states in the paragraph bridging the left and the right columns of page 10 334 the following:

15 "Syntactic methods include changing the diction and structure of text without significantly altering meaning or tone. For example, the sentence "Before the night is over, I will have finished" could be stated "I will have finished before the night is over."

20 Bender does not give any examples for changing the order in a sentence having exactly one linguistic head. Instead, Bender has two sentences and changes the order of the two sentences, without touching the sentences themselves with respect to their order of text components.

25 The inventive device, however, clearly defines that one would have to change something within the first sentence "Before the night is over" or one would have to change something in the second sentence "I will have finished." Furthermore, the inventive device says that, in any case, the order of the sentence has to be changed. This would mean for "Before the night is over" for example the following formulation alternative:

"Is before the night over" or "over before the night is" or "is the night before over." 30 From this little example, it can be seen that the two sentences for which Bender gives an example do not have any valid formulation alternatives so that, as

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defined in the last paragraph of Claim 1, the inventive device for hiding information would not touch the sentence "Before the night is over" and would also not touch the sentence "I will have finished," but would leave both sentences unchanged. This is due to the fact that for the sentence "I will have finished" 5 there do also not exist any correct formulation alternatives.

Thus, it is of importance to see that the exactly one linguistic head in the first sentence "Before the night is over" is "Is," and the linguistic head in the second sentence is "will have finished." In view of that, the two sentences "Before the 10 night is over" and "I will have finished" in Bender are, in the diction of Claim 1, second paragraph, indeed two sentences and cannot be considered as a single sentence. However, it might be the problem that the Examiner considers that "Before the night is over, I will have finished" is, in accordance with the definition of Claim 1, a single sentence. However, because the text "Before the night is 15 over, I will have finished" has two predicates ("is" and "have finished"), this text in the Bender example is to be considered as two sentences rather than a single sentence.

5. The Examiner states on page 3, second paragraph that the claim limitations 20 are three alternatives. However, these three alternatives all have in common that the order is varied. Again, Applicant emphasizes that Bender does not disclose "Varying the order of the text components."

6. Regarding page 4, second paragraph, the Examiner says that Bender's 25 example "Before the night is over, I will have finished" reads on "varies the order of the text components." However, this is not true because as outlined above, within a sentence having exactly one linguistic head, nothing is changed with respect to the order. Instead, Bender teaches to change the order of two different sentences in the definition of Claim 1.

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Furthermore, note the following:

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Bender is completely silent on simultaneously possible formulation alternatives; that there is partial information allocated to simultaneously possible formulation alternatives, and that the partial information has an overall probability of 1, so  
5 that arbitrary information can be hidden in the text.

Furthermore, Bender is completely silent on a parser included in the means for linguistically analyzing, which works sentence-wise and determines the exactly  
10 one linguistic head first and other linguistic text components of the sentence thereafter. Nothing like that is disclosed in Bender. Although the third paragraph of the right column of page 334 speaks of "Synonym tables", this has nothing to do with a parser looking for the head of the sentence, and looking for other text components. Instead, the synonym tables disclosed by Bender could, e.g. be used after the inventive head-directed parser has done its work.  
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Furthermore, Bender only discloses that there are synonym tables for certain terms. However, Claim 1 requires a dictionary/grammar stage having an entry for the linguistic heads. A synonym in a synonym table is simple a synonym but, in accordance with the invention, the linguistic head has an entry which is used for  
20 excluding parsing alternatives, resulting in grammatically incorrect formulation alternatives. Synonyms have nothing to do with such an entry usable for exchanging formulation alternatives. As soon as there is a synonym in a synonym table as disclosed by Bender, this is automatically a valid alternative. Thus, the pure presence of a synonym in a synonym table states that using the  
25 synonym is a correct alternative. However, the inventive entry for the linguistic head is for excluding incorrect parsing alternatives while, of course, not excluding correct formulation alternatives.

Furthermore, Bender is completely silent on the inventive feature that a certain  
30 probability distribution is used for allocating partial information to the simultaneously possible formulation alternatives. Whether there is an existing

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probability distribution or a probability distribution generated in accordance with specific rules known to a device for extracting hidden information from a text is not at all disclosed by Bender.

- 5 Furthermore, Bender is completely silent about the recursive nature of the invention and the usage of the recursive nature to early exclude formulation alternatives which would be grammatically incorrect. Bender does not even mention any tree-structured parser.
- 10 Importantly, also note that any straight-forward parser, such as a normal HPSG parser, is not at all interested in any formulation alternatives. A straight-forward parser is only interested in parsing a sentence, *i.e.*, defining syntactic elements of a sentence. But the search for formulation alternatives and the allocation of partial information to these formulation alternatives is not at all done by a
- 15 straight-forward parser. Thus, it becomes even more clear that any tree-structured parsing procedure in which, for each recursive level, incorrect formulation alternatives are excluded based on the entry for the predicate or linguistic head is not at all done in any straight-forward parser.
- 20 Finally, Bender is completely silent on what can be done, when valid formulation alternatives cannot be found, and Bender is completely silent on how to process this situation so that no extra information, *etc.* is necessary.

However, in accordance with the invention, nothing at all has to be signaled.

- 25 Instead, on the extractor-side, the same parser is used and the same dictionary/grammar stage is provided which applies the same rules and constraints for the linguistic head which is determined first, *i.e.*, before the text components and, when the extractor-side parser determines that no valid formulation alternatives exist, the extractor does not look for any partial information in this sentence but skips this sentence and processes the next one.

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This automatically provided and side-information-free processing of any arbitrary text is not at all indicated in Bender and is also not rendered obvious by Bender.

Finally, Applicant notes to the synergy between the linguistic analyzing means  
5 having a parser on the one hand and the inventive means for determining a plurality of formulation alternatives on the other hand, which uses the entry for the linguistic head to efficiently and error-free determine valid formulation alternatives or skipping sentences, where such formulation alternatives are not possible.

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Furthermore, Bender is completely silent on the further constraint that the partial information allocated to simultaneously possible formulation alternatives has to fulfill an additional constraint, which is the constraint that arbitrary information can be hidden in the text. When this constraint is not fulfilled, this automatically also  
15 results in a skipping the sentence, i.e., leaving the sentence unchanged as defined in the last paragraph of Claim 1.

In view of the claim amendments, and the foregoing comments, Applicant considers the claimed invention to be unobvious in view of the art of record.  
20 Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the claim rejections, such that the application may pass to issuance as U.S. Letters Patent.

7. Due to the fact that the method claims and the extractor claim, which has  
25 partly been discussed before have the same inventive features, the above arguments also apply for those claims.

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Should the Examiner find it helpful, he is encouraged to call Applicant's attorney,  
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Respectfully submitted,



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